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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,058	03/07/2005	Hartmut Albrodt	R.41000	1926
2119 7590 01/16/2007 RONALD E. GREIGG GREIGG & GREIGG P.L.L.C. 1423 POWHATAN STREET, UNIT ONE ALEXANDRIA, VA 22314			EXAMINER PATEL, VINIT H	
			ART UNIT 1764	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE 3 MONTHS		MAIL DATE 01/16/2007	DELIVERY MODE PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/509,058

Applicant(s)

ALBRODT ET AL.

Examiner

Vinit H. Patel

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 1-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 24Sep04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 21-28 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Fleck et al., USP 5,766,786.

Regarding the following claim(s), Fleck teaches:

21. A reforming system for a fuel cell comprising (C1/L7-10): an evaporating device (C3/L47-50, embodied as a burner, evaporator or equivalent thereof) for evaporating a raw fuel (C4/L1) and for delivering the evaporated raw fuel to a reforming unit 20 (C3/L47-49), at least one pump (4a,19) for metering the raw fuel that is conducted into the evaporating device (C3/L47-50), a control unit (13), at least one of said at least one pumps being a metering pump whose rpm is regulated by means of the control unit (13; C4/L18-20); and at least one monitoring device (C3/L1-7, monitoring device part of the control unit 13) serving to monitor the metering quantity of the raw fuel through the at least one regulated metering pump (Fig. 1; C2/L17-C4/L27).

22. The reforming system wherein at least one electric fuel pump (a pump motor) 19 serves as the metering pump (4a, 1; Fig. 1).

23. The reforming system wherein a high-pressure pump driven by an electric

motor (19) serves as the metering pump (C4/L9-17).

24. The reforming system wherein the at least one pump comprises first and second pumps (a two stage design, C3/L17-32) connected in series. The second pump being regulated while the first pump operates continuously is an operational condition and not a structural limitation. It is noted that apparatus claims cover what a device is, not what a device does. See MPEP 2114. The manner of operating the claimed apparatus is not a patentable distinction over the prior art apparatus, therefore the claims read upon Fleck.

25. The reforming system wherein the first and second pumps (a two stage design, C3/L17-32) are electric (motor) fuel pumps 19, and wherein the second electric fuel pump (7a, 7) is regulated by means of a timing module (a clocked solenoid metering valve; C3/L1-5).

26. The reforming system wherein the first pump is an electric fuel pump (19) acting as a pre-feed pump 4a, and the second pump is a high-pressure pump (7a) (Fig. 1; C4/L8-27).

27. The reforming system wherein the monitoring device is a pressure sensor (control unit 13 monitors and controls differential pressure controller 9a) (C4/L3-19).

28. The monitoring device monitors the current consumption of the at least one pump is an operational condition and not a structural limitation. It is noted that apparatus claims cover what a device is, not what a device does. See MPEP 2114. The manner of operating the claimed apparatus is not a patentable distinction over the prior art apparatus, therefore the claims read upon Fleck.

40. The method of using of a reforming system for metering a raw fuel to a fuel cell in a fuel cell vehicle (C1/L25-26).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al., USP 5,766,786, in view of Kirwan et al., US Pub. 2003/0163988.

Regarding the following claim(s):

29. Fleck teaches the reforming system of claim 21, but does not explicitly teach the monitoring device is a flow sensor which detects the metering quantity into the evaporating device. Kirwan teaches a reforming system and controls wherein control means may comprise any of the well known control means to monitor reformer operation such as flow sensors to provide feedback control to operate the system accordingly [0019], and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fleck to include a monitoring means of Kirwan for the purpose to provide a control means capable of functioning in real world operation conditions, for example from a cold start position [0006].

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al., USP 5,766,786, in view of Benz US Pub. 2005/0287049.

Regarding the following claim(s):

30. Fleck teaches the reforming system of claim 21, but does not explicitly teach the monitoring device is an rpm sensor, which measures the rpm of the at least one pump. Benz teaches a reforming system wherein fuel delivery is by pump means and metering is accomplished by suitable control such as rpm regulation, and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fleck with Benz for the purpose to provide monitoring and control means of the fuel pump by rpm regulation for the purpose to provide precision control of the fuel pump during cold start [0029, 0007].

Claims 31, 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al., USP 5,766,786, in view of Eisele et al., USP 4,501,248.

Regarding the following claim(s):

31 and 34. Fleck teaches the reforming system of claim 21 having an electric (motor) fuel pump 19 and timing module (C3/L1-5; Fig. 1), but does not explicitly teach a method for regulating the metering quantity in an electric fuel pump, comprising the steps of ascertaining a variable with the monitoring device, which variable serves as a controlled variable for the regulation, and utilizing an rpm sensor to determine the rpm of the electric fuel pump as a controlling variable for the regulation, the rpm being set by means of a timing module. Eisele teaches regulating the metering quantity in an electric fuel pump, comprising the steps of ascertaining a variable with the monitoring device 60 (a cpu), which variable serves as a controlled variable for the regulation (C1/L43-45), and utilizing an rpm sensor 72 (comparator) (C5/L39-47) to determine the rpm of the

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electric fuel pump as a controlling variable for the regulation (abstract), the rpm being set by means of a timing module 65 for determining fuel injection into an engine (Fig. 2), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Fleck to use the controller method of Eisele for the purpose to provide optimal fuel dispensing control to optimize the system as a whole (C1/L30-40).

32. Eisele teaches the step of ascertaining a variable comprises measuring the counterpressure with a pressure sensor (48), which counterpressure serves as a controlled variable for the regulation (C3/L35-50).

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al., USP 5,766,786 and Eisele et al., USP 4,501,248 in view of McArthur, USP 6,209,309.

Regarding the following claim(s):

33. Fleck in view of Eisele teach all of the limitations of claim 31 above and further teaches utilizing an rpm sensor 72 to determine the rpm of the at least one metering pump, and comparing a characteristic curve of the rpm as a function of the load state, stored in memory in the control unit (60), with the rpm measured by the rpm sensor (72) (C5/L39-47), but does not explicitly teach that the use of pulse width ratio of the trigger signal of the timing module serves as a controlling variable, and varying the rpm as a controlled variable by way of the pulse width ratio of the trigger signal of the timing module. McArthur teaches pulse width modulated fuel flow control to meter a fluid flow of a pump determined by timing periods that the valve is open during each cycle (C1/L10-20), and it would have been obvious to one of ordinary skill in the art at the

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time of the invention to modify Fleck in view of Eisele with McArthur for the purpose to provide a fuel flow control that is low cost and efficient method of fuel control (C1/L51-55).

Claims 35-37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al., USP 5,766,786, in view of Escobar, USP 5,780,729.

Regarding the following claim(s):

35 and 39. Fleck teaches a method for monitoring a metering pump (19) in a reforming system used in a motor vehicle (C1/L25-26), but does not explicitly disclose comprising outputting a warning signal by means of a drive-information system upon a deviation of a variable, ascertained by the monitoring device, from a set-point value. Escobar teaches a fuel delivery system wherein a warning signal is issued when an error occurs in the fueling system for example flow metering 8 (measured by a flow sensor) (C6/L56-59), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Fleck to include a warning signal when error in operation of fueling system occurs for the obvious purpose to provide a warning to unsafe fueling conditions.

36. Escobar the warning signal is output by the driver-information system if a monitoring device for monitoring the current consumption of the metering pump (8) (Fig. 1) detects that a defined maximum or minimum current limit has been exceeded or undershot for longer than a defined length of time (C6/L56-C7/L4).

37. Fleck in view of Escobar teach all of the limitations as applied to claim 35 above but is silent to wherein the a warning signal is output by a driver-information



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system if the rpm of the metering pump, measured by the rpm sensor, deviates from the set-point value. However such modification would merely be utilizing a value determining arrangement to sense the operating state based on rpm of pump as opposed to flow and would have been an obvious control variable modification to one of ordinary skill in the art at the time of the invention (See Eberspach et al., US Pub. 2002/0119408 at [0010]).

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fleck et al., USP 5,766,786, and Eisele et al., USP 4,501,248. in view of Escobar, USP 5,780,729.

Regarding the following claim(s):

38. Fleck in view of Eisele teach all of the limitations as applied to claim 34, but does not explicitly teach outputting the a warning signal by a driver-information system if the metering quantity measured by a flow sensor (8) deviates from its set-point value. Escobar teaches a fuel delivery system wherein a warning signal is issued when an error occurs in the fueling system for example flow metering 8 (measured by a flow sensor) (C6/L56-59), and it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Fleck to include a warning signal when error in operation of fueling system occurs for the obvious purpose to provide a warning to unsafe fueling conditions.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinit H. Patel whose telephone number is (571) 272-0856. The examiner can normally be reached on 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

vhp



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